

Listing of Claims

This listing of claims shall replace all prior versions, and listings, of claims in the instant application.

Claim 1 (Currently Amended) A non-contact apparatus for measuring the shape or surface characteristics of a work roll used in the manufacture of sheet steel and other sheet metal products comprising

a sensor having a non-contact measuring probe,

a linear rail,

a means for moving the sensor along the rail at a non-contact measuring distance from the surface of the work roll and in a line which is in parallel with the center line of the work roll,

a means of collecting shape or surface characteristics data from the sensor and measuring a shape or surface characteristic selected from the group consisting of crown, taper, Ra, PPI, traverse, body diameter, defects and inclusions,

wherein the sensor is a capacitance sensor or an inductance sensor.

Claim 2 (Original) The apparatus of claim 1 further comprising a means for positioning the rail in parallel with the center line of the roll.

Claim 3 (Original) The apparatus of claim 1 wherein the sensor is a capacitance sensor.

Claim 4 (Original) The apparatus of claim 1 further comprising a means of translating and displaying the data.

Claim 5 (Previously Presented) A non-contact apparatus for measuring the shape or surface characteristics of a work roll comprising

a sensor having a non-contact measuring probe,

a linear rail,

a means for moving the sensor along the rail at a non-contact measuring distance from the surface of the work roll and in a line which is in parallel with the center line of the work roll, and

a means of collecting shape or surface characteristics data from the sensor

wherein the sensor comprises multiple measuring probes for simultaneously measuring two or more of crown, taper, Ra, PPI, traverse and body diameter.

Claim 6 (Original) The apparatus of claim 1 wherein the probe base line specification measuring range equals 0.00" to 0.0005" with a tolerance of $\pm 1\%$.

Claim 7 (Original) The apparatus of claim 1 wherein the probe base line specification measuring range equals 0.00" to 0.00005" with a tolerance of $\pm 0.5\%$.

Claim 8 (Currently Amended) A method of measuring the shape or surface characteristics of a work roll used in the manufacture of sheet steel and other sheet metal products comprising

providing a sensor having a non-contact measuring probe with a linear rail and a means for moving the sensor along the rail at a non-contact measuring distance from the surface of the roll and in a line which is in parallel with the center line of the work roll,

moving the sensor along the rail while collecting shape or surface characteristics data from the sensor,
translating the data to a measurement of crown, taper, Ra, PPI, traverse, body diameter, defects and inclusions,

wherein the sensor is a capacitance sensor or an inductance sensor.

Claim 9 (Cancelled)

Claim 10 (Currently Amended) The method of claim 9 8 wherein the data is displayed as a measurement of crown, taper, Ra, PPI, traverse, body diameter, defects or inclusions.

Claim 11 (Previously Presented) The method of claim 8 wherein the data is collected at a rate of about 1,000 data points per second.

Claim 12 (Previously Presented) The method of claim 8 wherein the data is collected at a rate of about 4,000 data points per second or 16,000 data points per second or more than 16,000 data points per second.

Claim 13 (Previously Presented) The method of claim 8 wherein the roll is rotated about its center line during measuring.

Claim 14 (Previously Presented) The apparatus of claim 1 further comprising a means for rotating the roll about its center line.

Claim 15 (Previously Presented) The apparatus of claim 1 wherein the sensor is an analog sensor.

Claim 16 (Previously Presented) The method of claim 8 wherein the sensor is an analog sensor.

Claim 17 (Previously Presented) A method of measuring the shape or surface characteristics of a work roll comprising

providing a sensor having multiple measuring probes for simultaneously measuring two or more of crown, taper, Ra, PPI, traverse and body diameter with a linear rail and a means for moving the sensor along the rail at a non-contact measuring distance from the surface of the roll and in a line which is in parallel with the center line of the work roll, moving the sensor along the rail while collecting shape or surface characteristics data from the sensor

Claim 18 (Previously Presented) The method of claim 17 further comprising the steps of translating and displaying the data.

Claim 19 (Previously Presented) The method of claim 17 wherein the data is collected at a rate of about 1,000 data points per second.

Claim 20 (Previously Presented) The method of claim 17 wherein the data is collected at a rate of about 4,000 data points per second or 16,000 data points per second or more than 16,000 data points per second.